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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
ORTIZ CRIADO, JORGE L	
ART UNIT	**PAPER NUMBER**
2655	

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/913,430	Applicant(s) UNO ET AL.	
	Examiner Jorge L. Ortiz-Criado	Art Unit 2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 November 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 13-20* is/are rejected.

7)☒ Claim(s) 12 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *05/13/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-11 and 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al. U.S. patent no. 6,221,455 in view of Harigai et al. JP. Publication No. 08-104060.

Regarding claim 1, Yasuda et al. discloses an optical information recording medium, comprising one or more information layers including recording layers, respectively, each recording layer containing a material that can exhibit transition between two optically different states in response to irradiation with a laser beam as a main component, wherein, in at least one of the recording layers, one of the two states of said material is an amorphous state (see col. 4, lines 26-65; col. 8, line 14 to col. 9, line36),

wherein the information layer including the recording layer that contains said material as a main component thereof has a light transmittance of not less than 30 % when irradiated with a laser beam (see col. 10 line 59 to col. 11 line 27)

Yasuda et al. teaches and has the desirability of having materials with sufficient reproducible reflectance, high transmittance and fast transition between two optically different

states when irradiated with the laser beam and also obtaining a higher recording density (see col. 2, lines 39-46; col.9, lines 52 to col. 10, line 58)

But Yasuda et al. does not expressly disclose wherein said material has an energy gap ranging from 0.9 eV to 2.0 eV in the amorphous state and irradiating with a laser beam having a wavelength ranging from 300 nm to 450 nm.

However, this feature is well known in the art as evidenced by Harigai et al., which discloses an optical information recording medium comprising one or more information layers including recording layers each recording layer containing a material that can exhibit transition between two optically different states in response to irradiation with a laser beam as a main component and said material having an energy gap raging from (0.9 eV to 2.0 eV) / (1.0eV or more) in the amorphous state and wherein said material is irradiated with a laser beam having a wavelength from 300 to 450nm (see Detailed Description [006]-[0011]).

It would have been obvious to one with ordinary skill in the art at the time of the invention to include a recording layer containing a material that can exhibit transition between two optically different states in response to irradiation with a laser beam as a main component having an energy gap raging from (0.9 eV to 2.0 eV) in order to obtain obtaining sufficient reproducible reflectance, high transmittance and fast transition between two optically different states when irradiated with the laser beam that is fully compatible with a laser beam ranging from 300nm to 450nm obtaining a higher density recording, as teaches by

Regarding claim 2, the combination of Yasuda et al with Harigai et al. shows wherein, in at least two of the information layers, the recording layers exhibit transition between two

optically different states in response to irradiation with a laser beam that is incident on said material of the recording layers from a same direction (see Yasuda et al col. 4, lines 26-65; col. 8, line 14 to col. 10, line 58)

Regarding claim 3, the combination of Yasuda et al with Harigai et al. shows wherein in at least one of the information layer closest to an incident side of the laser beam, said material as the main component of the recording layer of said information layer has an energy gap ranging from 0.9 eV to 2.0eV in the amorphous state (see Harigai et al Detailed Description [006]-[0011]), and

said information layer has a light transmittance of not less than 30 % when irradiated with a laser beam having a wavelength ranging from 300 nm to 450 nm. (see Yasuda et al col. 10 line 59 to col. 11 line 27)

Regarding claim 4, the combination of Yasuda et al with Harigai et al. shows wherein said recording layer has a thickness ranging from 1 nm to 25 nm (See Yasuda et al col. 14, lines 45-63)

Regarding claim 5, the combination of Yasuda et al with Harigai et al. shows wherein at least one of the recording layers contains a material that can exhibit a reversible transition between a crystalline state and an amorphous state as a main component. (see Yasuda et al col. 4, lines 26-65; col. 8, line 14 to col. 10, line 58) (see Harigai et al Detailed Description [006]-[0011])

Regarding claim 6, the combination of Yasuda et al with Harigai et al. shows wherein the recording layer containing the material that can exhibit a reversible transition between the crystalline state and the amorphous state as a main component has a thickness ranging from 1 nm to 15 nm (See Yasuda et al col. 14, lines 45-63)

Regarding claim 7, the combination of Yasuda et al with Harigai et al. shows wherein, as to the recording layer containing the material that can exhibit a reversible transition between the crystalline state and the amorphous state as a main component, a reflectance Rc of said recording layer with respect to the laser beam when said recording layer is in the crystalline state is higher than a reflectance Ra thereof with respect to the laser beam when said recording layer is in the amorphous state (See Yasuda et al col. 8, line 14 to col. 9, line36)

Regarding claim 8, the combination of Yasuda et al with Harigai et al. shows wherein, as to the recording layer containing the material that can exhibit a reversible transition between the crystalline state and the amorphous state as a main component, a light absorptance Ac of said recording layer with respect to the laser beam when the recording layer is in the crystalline state is greater than 80 % of a light absorptance Aa thereof when said recording layer is in the amorphous state (See Yasuda et al. col. 12, table 1)

Regarding claim 9, the combination of Yasuda et al with Harigai et al. shows wherein the recording layer containing the material that can exhibit a reversible transition between the crystalline state and the amorphous state as a main component satisfies a relationship expressed

as: na > 2.5; nc > 2.5; and ka < 2.0 where nc represents a refractive index of said material in the crystalline state, na represents a refractive index of said material in the amorphous state, and ka represents an extinction coefficient of said material in the amorphous state (See Yasuda et al col. 12, line 44 to col. 13 line 9)

Regarding claim 10, the combination of Yasuda et al with Harigai et al. shows wherein the recording layer containing the material that can exhibit a reversible transition between the crystalline state and the amorphous state as a main component satisfies a relationship expressed as: $|kc-ka| \geq 0.5$ where kc represents an extinction coefficient of said material in the crystalline state (See Yasuda et al col. 12, line 44 to col. 13 line 9)

Regarding claim 11, the combination of Yasuda et al with Harigai et al. shows wherein the na and nc satisfy a relationship expressed as: $na-nc \leq 1.0$ (See Yasuda et al col. 12, line 44 to col. 13 line 9)

Regarding claim 13, the combination of Yasuda et al. with Harigai et al. shows wherein said recording layer contains Se, and a content of Se in said recording layer is not less than 20 at% and not more than 60 at%. (See Yasuda et al col. 8, line 14 to col. 10, line 58) and (see Harigai et al Detailed Description [006]-[0011])

Regarding claim 14, the combination of Yasuda et al. with Harigai et al. shows wherein said recording layer contains Te and X, X representing at least one element selected from the

group consisting of In, Al, Ga, Zn, and Mn, wherein a content of Te in said recording layer is between 20 at% and 60 at%, and a content of X therein is between 20 at% and 50 at%. (See Yasuda et al col. 8, line 14 to col. 10, line 58) and (see Harigai et al Detailed Description [006]-[0011])

Regarding claim 15, the combination of Yasuda et al. with Harigai et al. shows wherein said recording layer further contains at least one element selected from the group consisting of Al, Ga, In, Si, Ge, Sn, Sb, Bi, Sc, Ti, Nb,Cr, Mo Co, Cu, Ag, Au, Pd, N, and O. (See Yasuda et al col. 8, line 14 to col. 10, line 58) and (see Harigai et al Detailed Description [006]-[0011])

Regarding claim 16, the combination of Yasuda et al. with Harigai et al. shows wherein the information layer including said recording layer has a crystallization promoting layer that is provided on at least one side of said recording layer so as to be in contact with a surface of said recording layer on the side (see Yasuda et al col. 4, lines 26-65; col. 8, line 14 to col. 10, line 58) (see Harigai et al Detailed Description [006]-[0011])

Regarding claim 17, the combination of Yasuda et al. with Harigai et al. shows wherein the crystallization promoting layer contains N. (see Yasuda et al col. 4, lines 26-65; col. 8, line 14 to col. 10, line 58) (see Harigai et al Detailed Description [006]-[0011])

Regarding claim 18, the combination of Yasuda et al. with Harigai et al. shows a method for recording, reproducing, or erasing information for use with the optical information

recording medium according to claim 1, comprising: irradiating said material as the main component of the recording layer in the medium with a laser beam converged to a microspot by an optical system so as to cause the material to shift to an optically different state, wherein the laser beam used for recording the information is set so as to have a wavelength ranging from 300 nm to 450 nm (see Harigai et al Detailed Description [006]-[0011])

Regarding claim 19, the combination of Yasuda et al. with Harigai et al. shows an optical information recording/reproducing system, comprising the optical information recording medium according to claim 1, and a laser beam source that generates a laser beam for irradiating the optical information recording medium, wherein the laser beam has a wavelength ranging from 300 nm to 450 nm (see Harigai et al Detailed Description [006]-[0011])

Regarding claim 20, the combination of Yasuda et al. with Harigai et al. shows wherein said recording layer further contains at least one element selected from the group consisting of Al, Ga, In, Si, Ge, Sn, Sb, Bi, Sc, Ti, Nb,Cr, Mo Co, Cu, Ag, Au, Pd, N, and O (See Yasuda et al col. 8, line 14 to col. 10, line 58) and (see Harigai et al Detailed Description [006]-[0011])

Allowable Subject Matter

2. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach or suggest either alone or in combination wherein the recording layer containing the material that can exhibit a reversible transition between the crystalline state and the amorphous state, as a main component satisfies a relationship expressed as: **$E_o(c) \leq E_o(a)$ - 0.15 where $E_o(c)$ represents an energy gap of said material in the crystalline state, and $E_o(a)$ represents an energy gap of said material in the amorphous state.**

Response to Arguments

1. Applicant's arguments filed 11/18/2004 have been fully considered but they are not persuasive.

Applicants argues that Harigai does not teach a desired range of energy gaps 0.9 eV to 2.0eV.

The Examiner cannot concur because Harigai teaches and suggest that the energy gap of the recording medium should be **1.0 eV** or more, which falls in the range claimed. Harigai clearly teaches an energy gap within the range claimed. Furthermore, as Applicants acknowledge, Harigai teaches that the 1.0eV or more is satisfactory and that any range of energy gap, which Harigai suggest 1.0eV or more, can be used with a recording medium. Therefore, as outlined above, it would have been obvious to one with ordinary skill in the art at the time of the invention to include a recording layer containing a material that can exhibit transition between two optically different states in response to irradiation with a laser beam as a main component having an energy gap raging from (0.9 eV to 2.0 eV) in order to obtain obtaining sufficient reproducible reflectance

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jorge L. Ortiz-Criado whose telephone number is (571) 272-7624. The examiner can normally be reached on Mon.-Thu.(8:30 am - 6:00 pm),Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne R. Young can be reached on (571) 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

joc

W. R. YOUNG
PRIMARY EXAMINER